

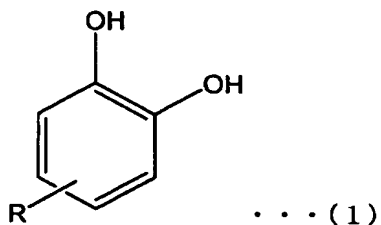
CLAIMS

1. A positive-type photoresist comprising:

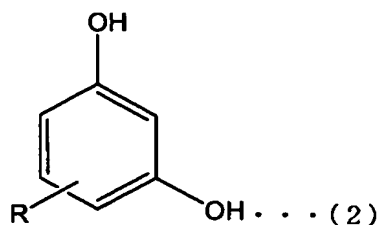
a novolac resin which has a benzene nucleus containing
5 two or more hydroxyl groups and has a weight-average molecular
weight of 1,000 to 20,000 and/or a derivative of the novolac
resin.

2. The positive-type photoresist according to claim 1,
10 wherein the benzene nucleus containing two or more hydroxyl
groups has a structure represented by any one of the following
formulas (1) to (6):

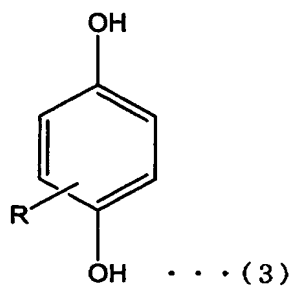
[Chem. 37]



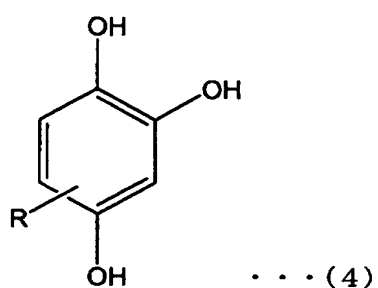
15 [Chem. 38]



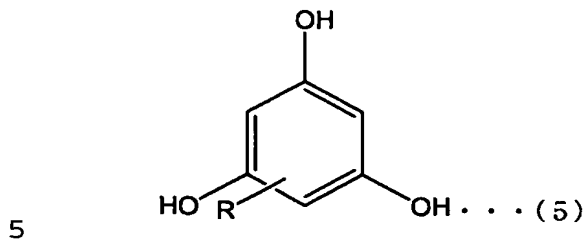
[Chem. 39]



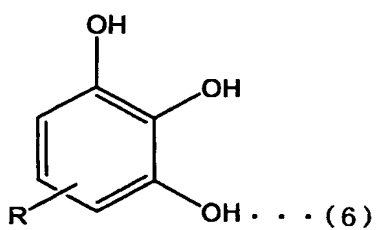
[Chem. 40]



[Chem. 41]



[Chem. 42]



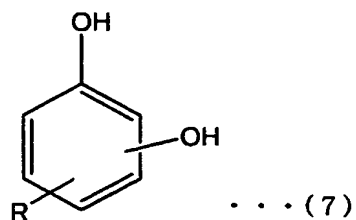
where R in each of the formulas (1) to (6) represents a
 10 hydrogen atom or a lower alkyl group having 6 or less carbon
 atoms.

3. The positive-type photoresist according to claim 1 or 2, wherein the novolac resin is obtained by alternating copolymerization of at least two kinds of monomers.

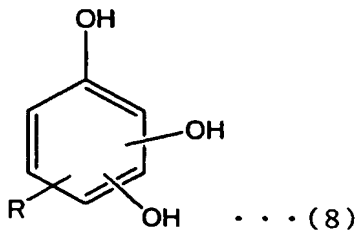
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4. The positive-type photoresist according to any one of claims 1 to 3, wherein the novolac resin is obtained by alternating copolymerization of at least one kind of monomers represented by the following formulas (7) to (16) and at least one kind of monomers represented by the following formulas (17) to (26), and wherein at least one kind of monomers represented by the following formulas (7), (8), (17), and (18) each containing two or more hydroxyl groups is used as the monomer for alternating copolymerization:

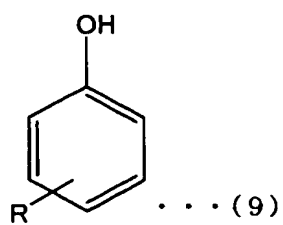
15 [Chem. 43]



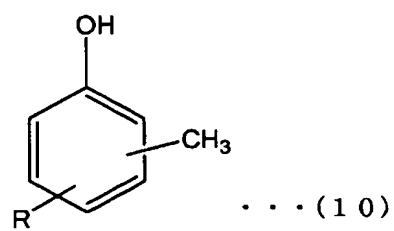
[Chem. 44]



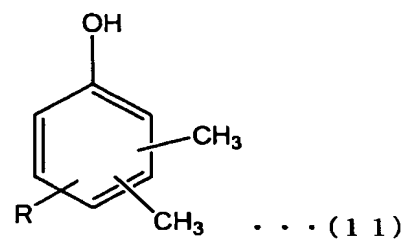
[Chem. 45]



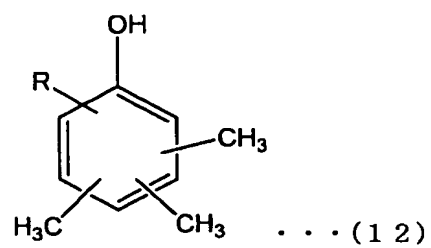
[Chem. 46]



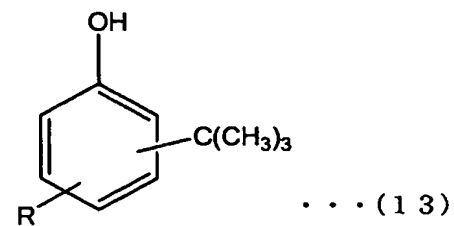
[Chem. 47]



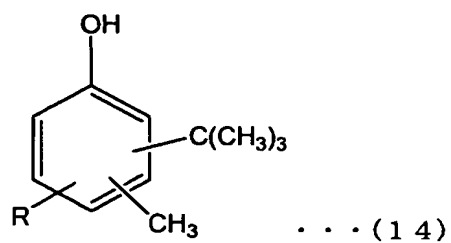
[Chem. 48]



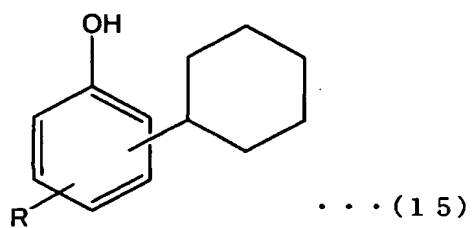
[Chem. 49]



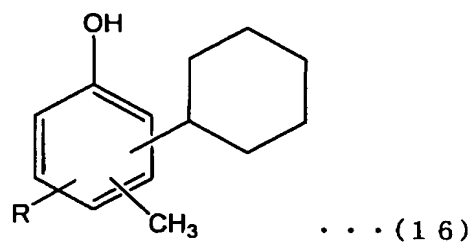
10 [Chem. 50]



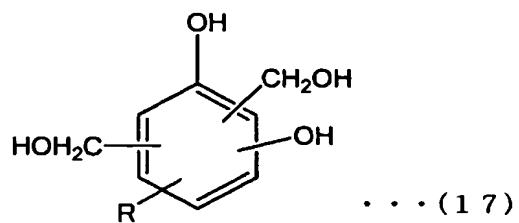
[Chem. 51]



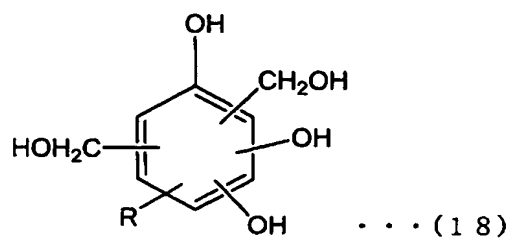
[Chem. 52]



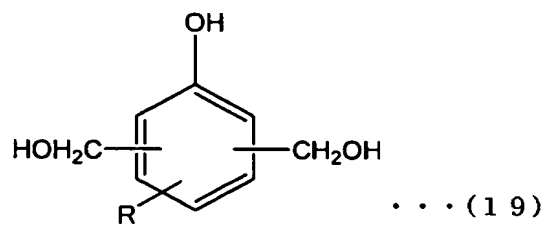
[Chem. 53]



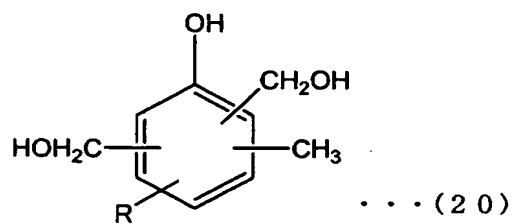
[Chem. 54]



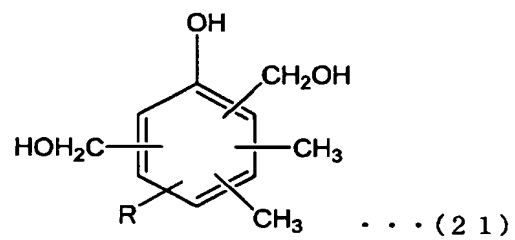
10 [Chem. 55]



[Chem. 56]

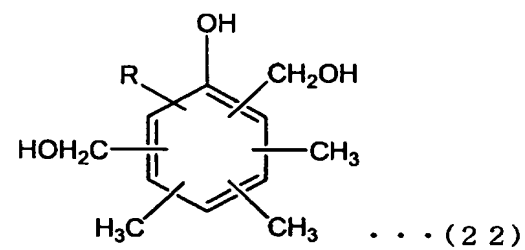


[Chem. 57]

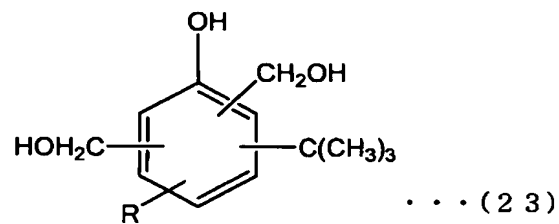


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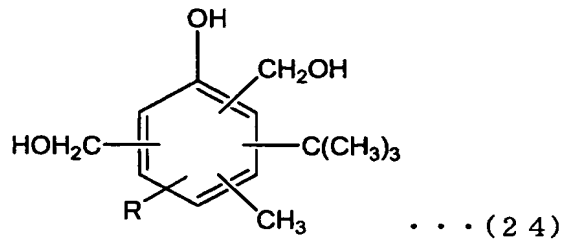
[Chem. 58]



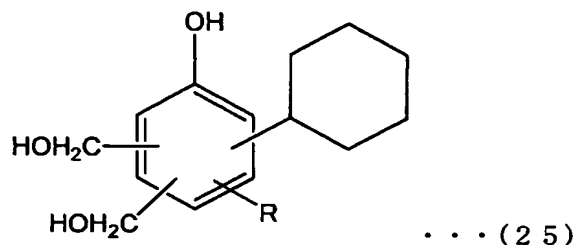
[Chem. 59]



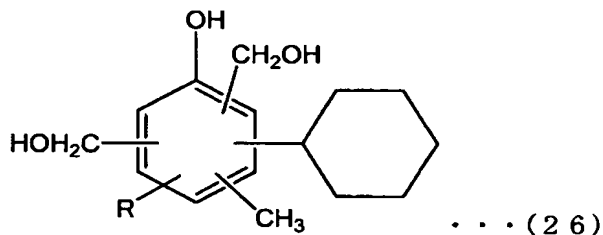
10 [Chem. 60]



[Chem. 61]



[Chem. 62]



5

where R in each of the formulas (7) to (26) represents a hydrogen atom or a lower alkyl group having 6 or less carbon atoms.

10

5. The positive-type photoresist according to claim 4, wherein 30 parts by weight or more of the total amount of the monomers represented by the formulas (7), (8), (17), and (18) each containing two or more hydroxyl groups is used with respect to 100 parts by weight of total amount of the monomers represented by the formulas (7) to (16) and the monomers

represented by the formulas (17) to (26).

6. The positive-type photoresist according to any one of claims 1 to 5, wherein the derivative of the novolac resin is obtained by replacing some of the hydroxyl groups of the novolac resin with a substituent.

7. The positive-type photoresist according to claim 6, wherein some of the hydroxyl groups are esterified and/or etherified.

8. The positive-type photoresist according to claim 6 or 7, wherein the replacement of some of the hydroxyl groups with a substituent is carried out using at least one compound selected from the group consisting of alkyl ethers, aryl ethers, benzyl ethers, triarylmethyl ethers, trialkylsilyl ethers, and tetrahydropyranyl ethers.

9. The positive-type photoresist according to claim 6 or 7, wherein the replacement of some of the hydroxyl groups with a substituent is carried out using at least one compound selected from the group consisting of acetate, benzoate, methanesulfonic acid esters, and benzenesulfonic acid esters.

10. The positive-type photoresist according to any one

of claims 1 to 9, further comprising a photosensitive compound.

11. The positive-type photoresist according to claim 10,
wherein 5 to 50 parts by weight of the photosensitive compound
5 is mixed with 100 parts by weight of total amount of the novolac
resin and a derivative of the novolac resin.

12. The positive-type photoresist according to any one
of claims 1 to 9, wherein the derivative of the novolac resin
10 is a photosensitive novolac resin obtained by reacting the
novolac resin with a photosensitive compound.

13. The positive-type photoresist according to claim 12,
wherein the photosensitive novolac resin is one obtained by
15 reacting 5 to 50 parts by weight of the photosensitive compound
with 100 parts by weight of the novolac resin.

14. The positive-type photoresist according to claim 12
or 13 which comprises the novolac resin and the photosensitive
20 novolac resin, wherein the photosensitive novolac resin is
obtained by reacting 10 to 60 parts by weight of a photosensitive
compound with 100 parts by weight of the novolac resin, and
wherein the amount corresponding to the photosensitive compound
is in the range of 5 to 50 parts by weight with respect to 100
25 parts by weight of total amount of the novolac resin and the

photosensitive novolac resin.

15. The positive-type photoresist according to any one
of claims 10 to 14, wherein the photosensitive compound is
5 1,2-naphthoquinonediazidosulfonyl halide.

16. The positive-type photoresist according to any one
of claims 1 to 15, further comprising an anionic surfactant in
an amount of 1 to 20 parts by weight with respect to 100 parts
10 by weight of total amount of the novolac resin and a derivative
of the novolac resin.

17. The positive-type photoresist according to any one
of claims 1 to 16, further comprising colloidal silica in an
15 amount of 50 to 300 parts by weight with respect to 100 parts
by weight of total amount of the novolac resin and a derivative
of the novolac resin.

18. The positive-type photoresist according to any one
20 of claims 1 to 17, further comprising a viscosity-controlling
agent in an amount of 100 to 700 parts by weight with respect
to 100 parts by weight of total amount of the novolac resin and
a derivative of the novolac resin.

25 19. A method for manufacturing a structure having a

circuit formed using a resist pattern, comprising the steps of:

forming a resist film on a surface of a substrate by the use of the positive-type photoresist according to any one of claims 1 to 18;

5 exposing the resist film to light and carrying out development;

forming a circuit by the use of the resist pattern; and removing the resist film.

10 20. The method for manufacturing a structure having a circuit formed using a resist pattern according to claim 19, wherein development is carried out using as a developer, an aqueous alkali solution whose alkali substance content is 0.3 wt% or less, in the step of exposing the resist film to light
15 and carrying out development.

21. A method for manufacturing a structure having a circuit formed using the resist pattern according to claim 19 or 20, wherein a resist film is removed with ozone water in the
20 step of removing the resist film.